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(54) **EYELETS**

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(52) **U.S. Cl.**
CPC ***A44B 13/0076*** (2013.01); ***A44B 13/0058*** (2013.01); ***A44B 13/0064*** (2013.01)

(58) **Field of Classification Search**
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USPC 16/2.1, 2.2, 2.5; 24/713.6, 713.7
See application file for complete search history.

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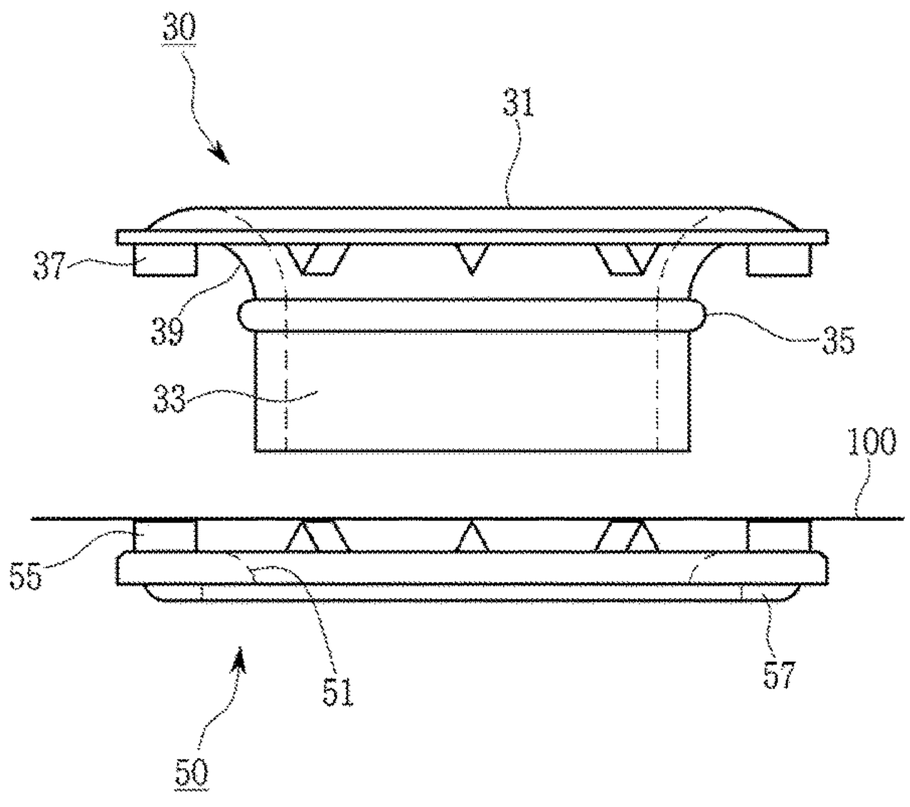
(57) **ABSTRACT**

The present disclosure relates to an eyelet which is easily fastened and has a strong coupling force, and the eyelet of the present disclosure includes an eyelet base and an eyelet washer, wherein the eyelet base includes: a disk-shaped base part having a circular hollow hole formed at a center portion thereof; a cylindrical fastening part formed to extend from an inner circumference of the base part formed by the hollow hole to be orthogonal to the base part, and inserted into a circular hollow hole in a center portion of the eyelet washer to be fastened to the eyelet washer; and a fixing protrusion formed in a ring shape on an outer circumference of the fastening part to prevent separation of the eyelet washer from the fastening part.

9 Claims, 6 Drawing Sheets



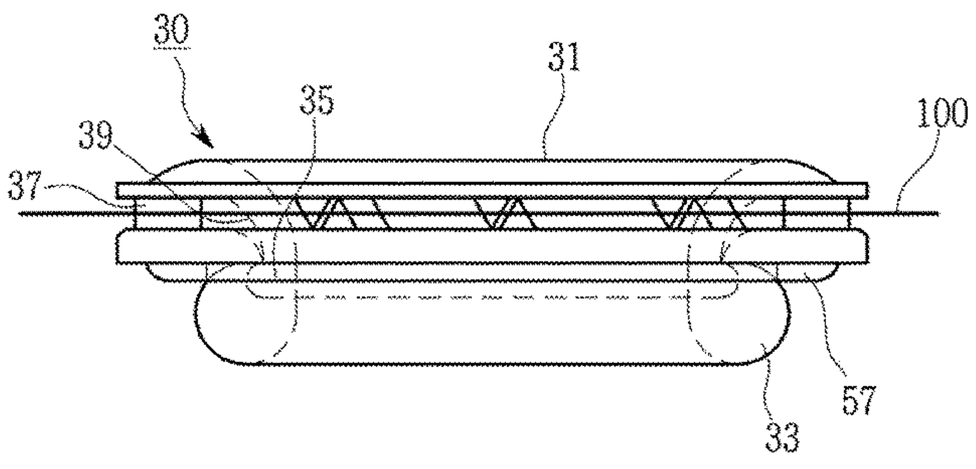


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FIG. 1

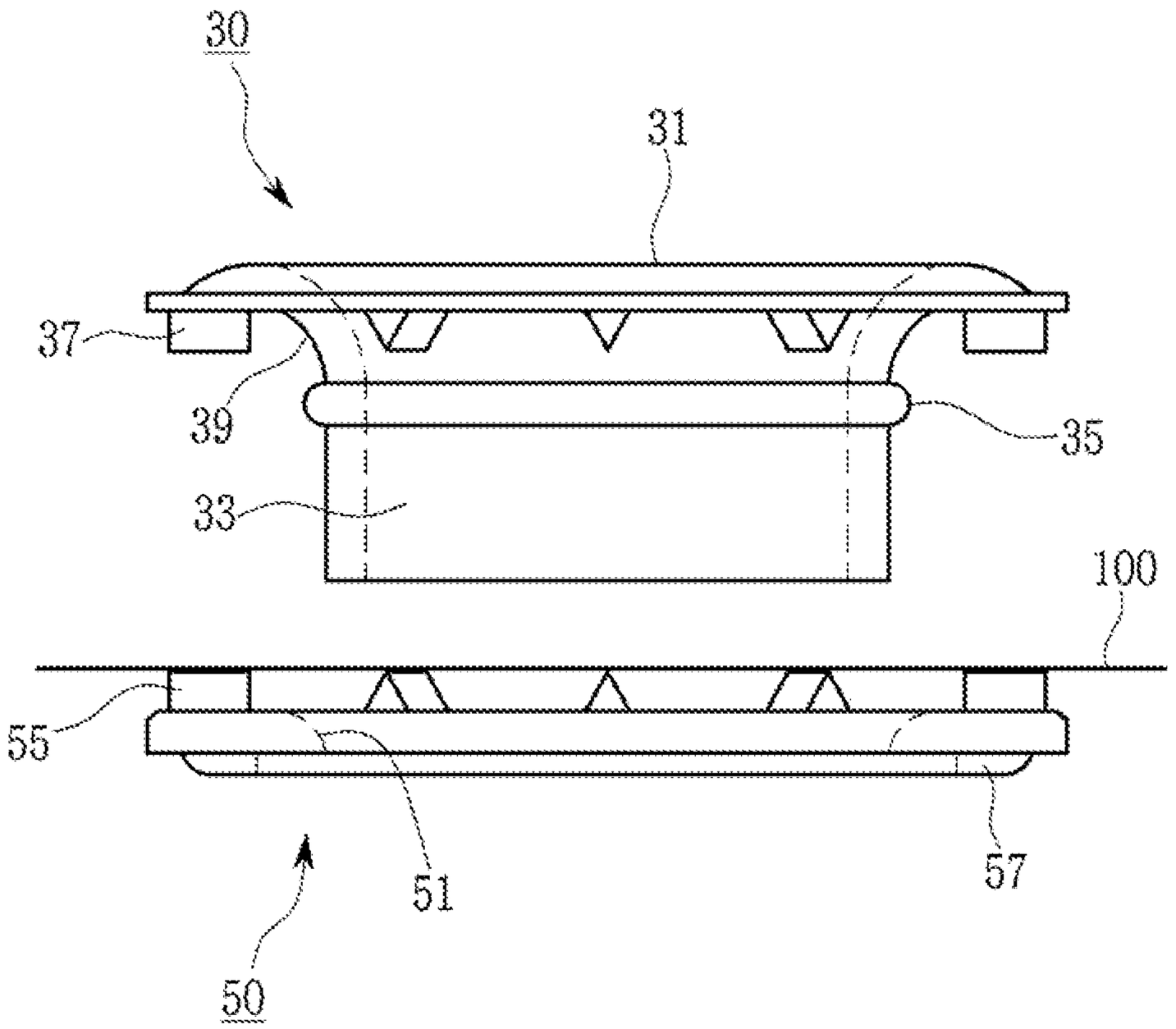


FIG. 2

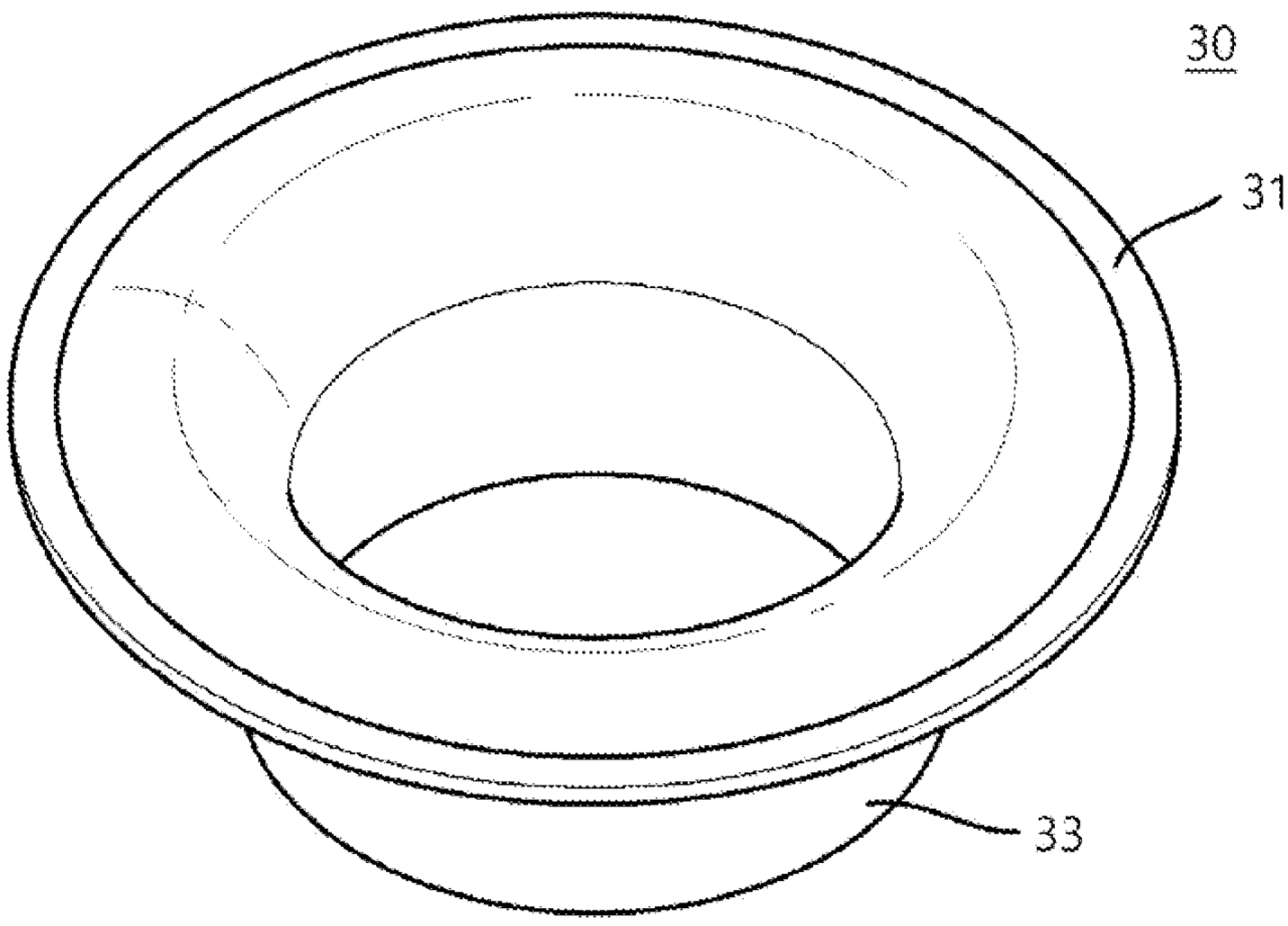


FIG. 3

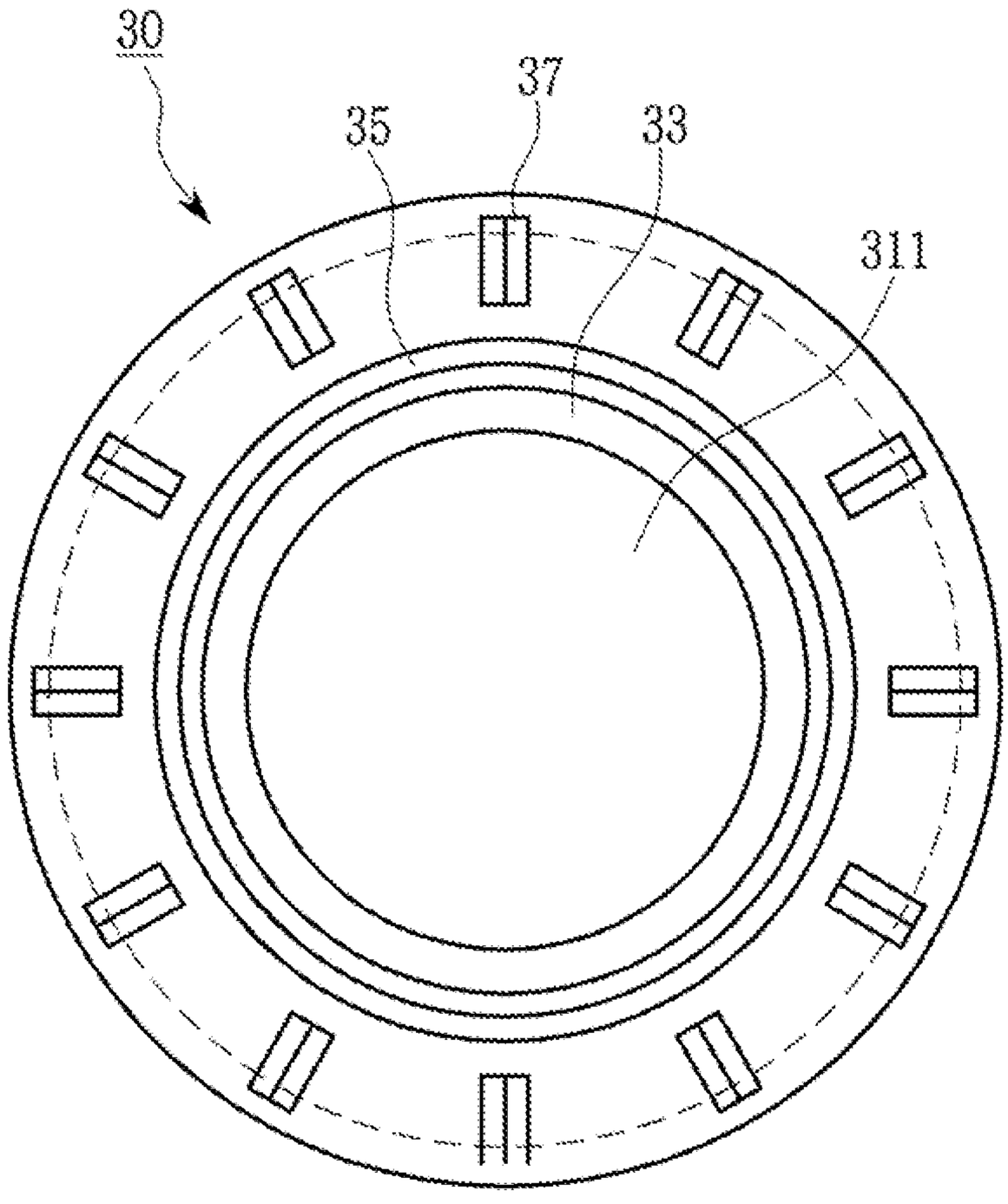


FIG. 4

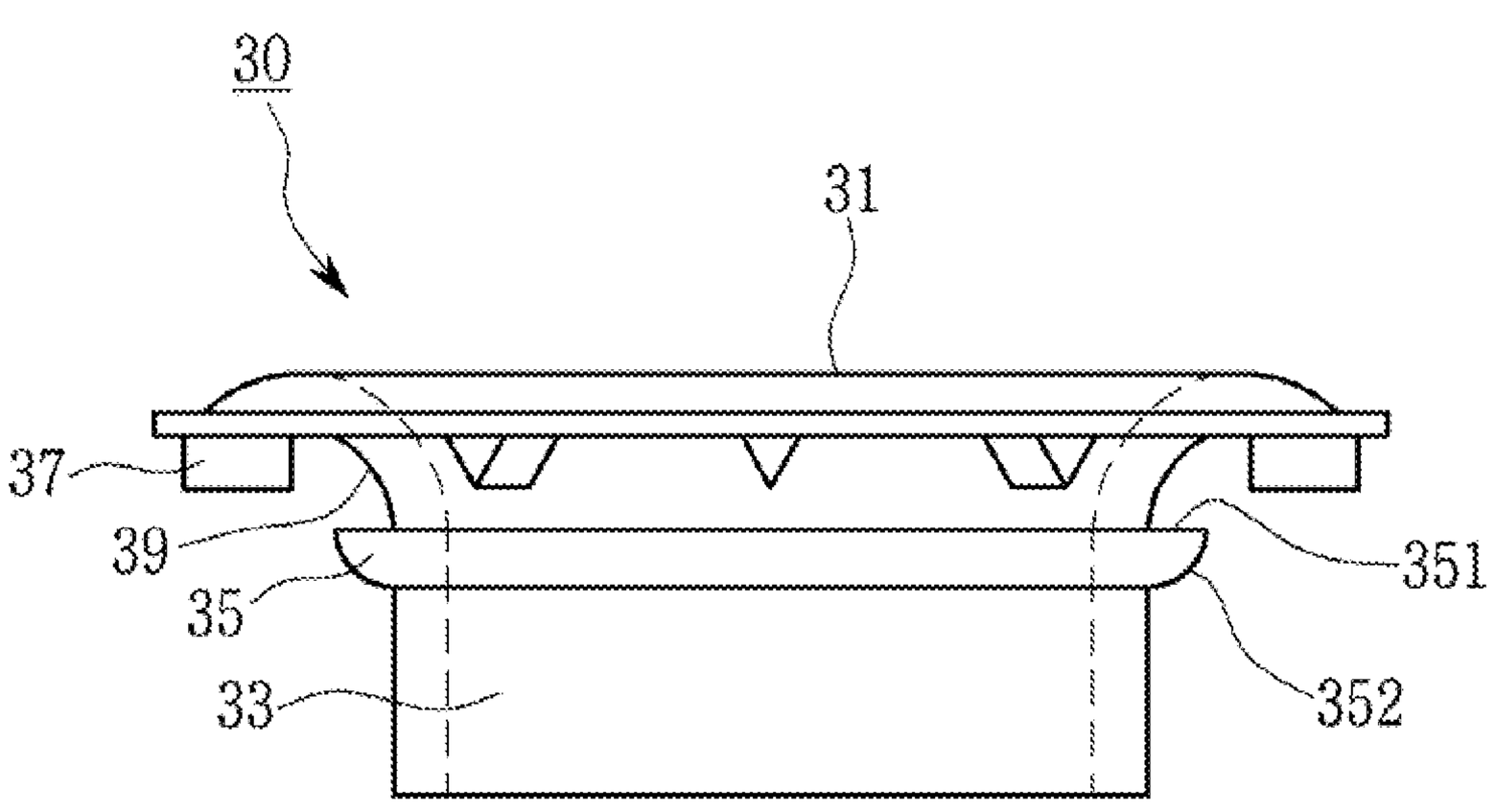


FIG. 5

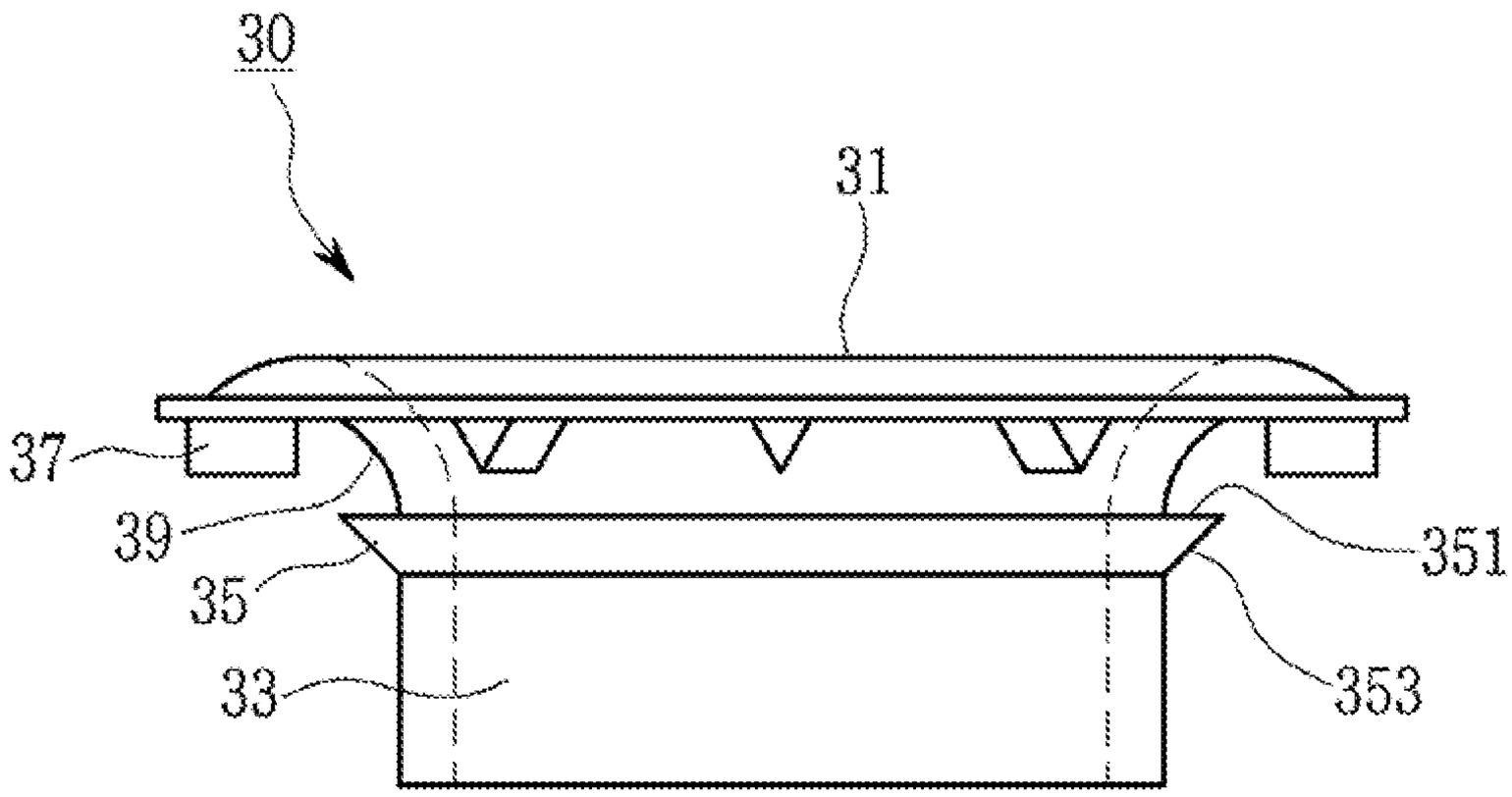


FIG. 6

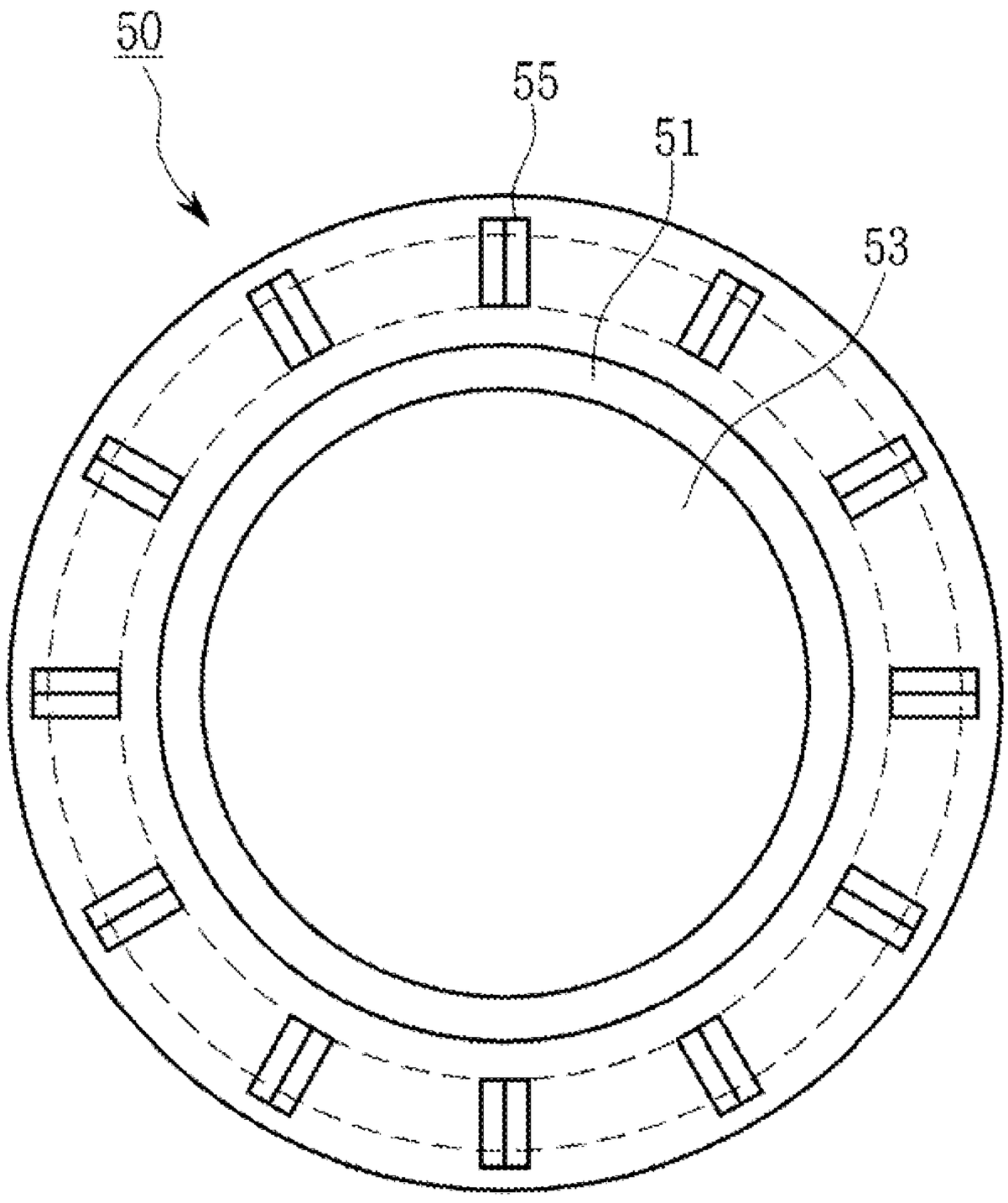


FIG. 7

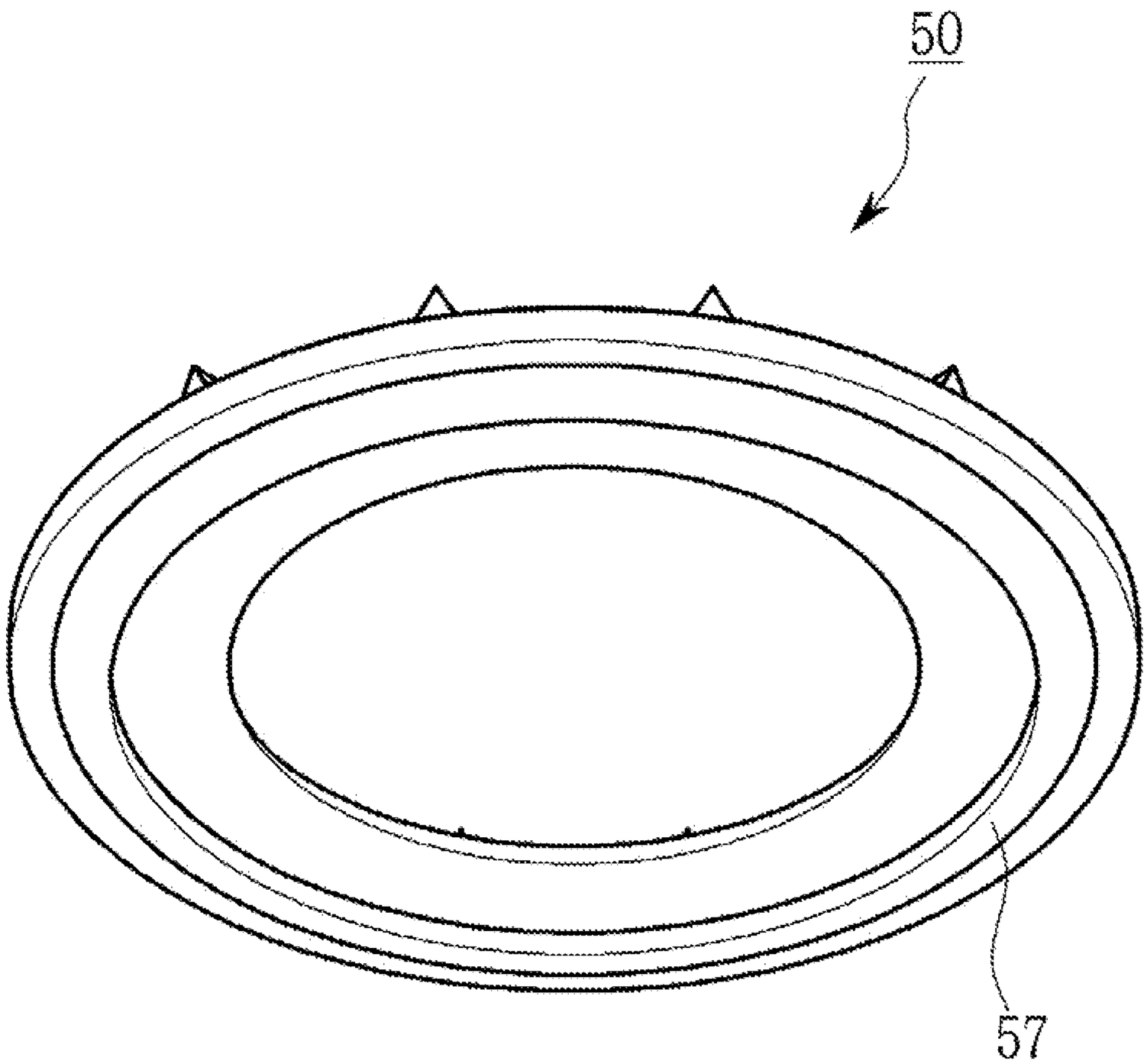


FIG. 8

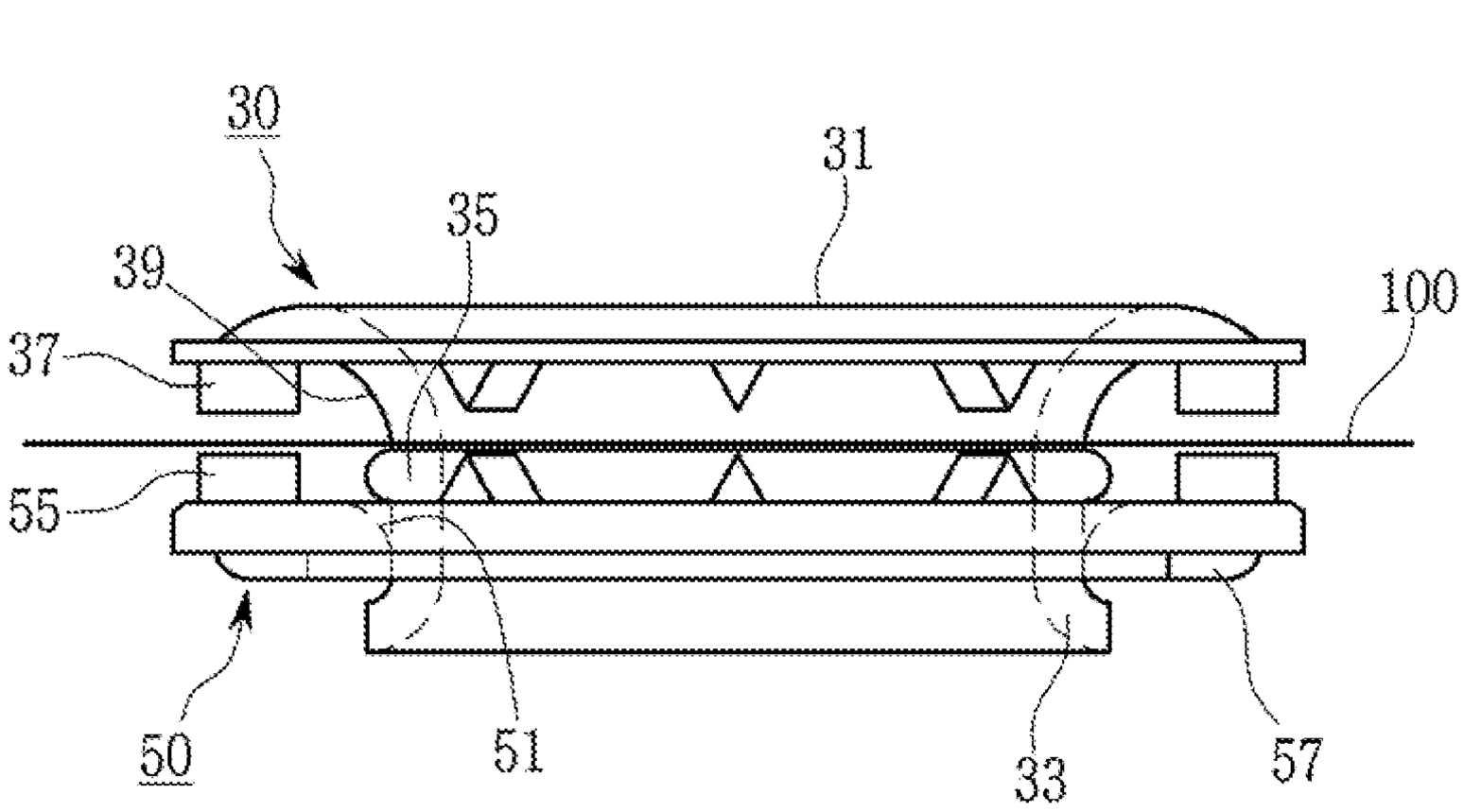


FIG. 9

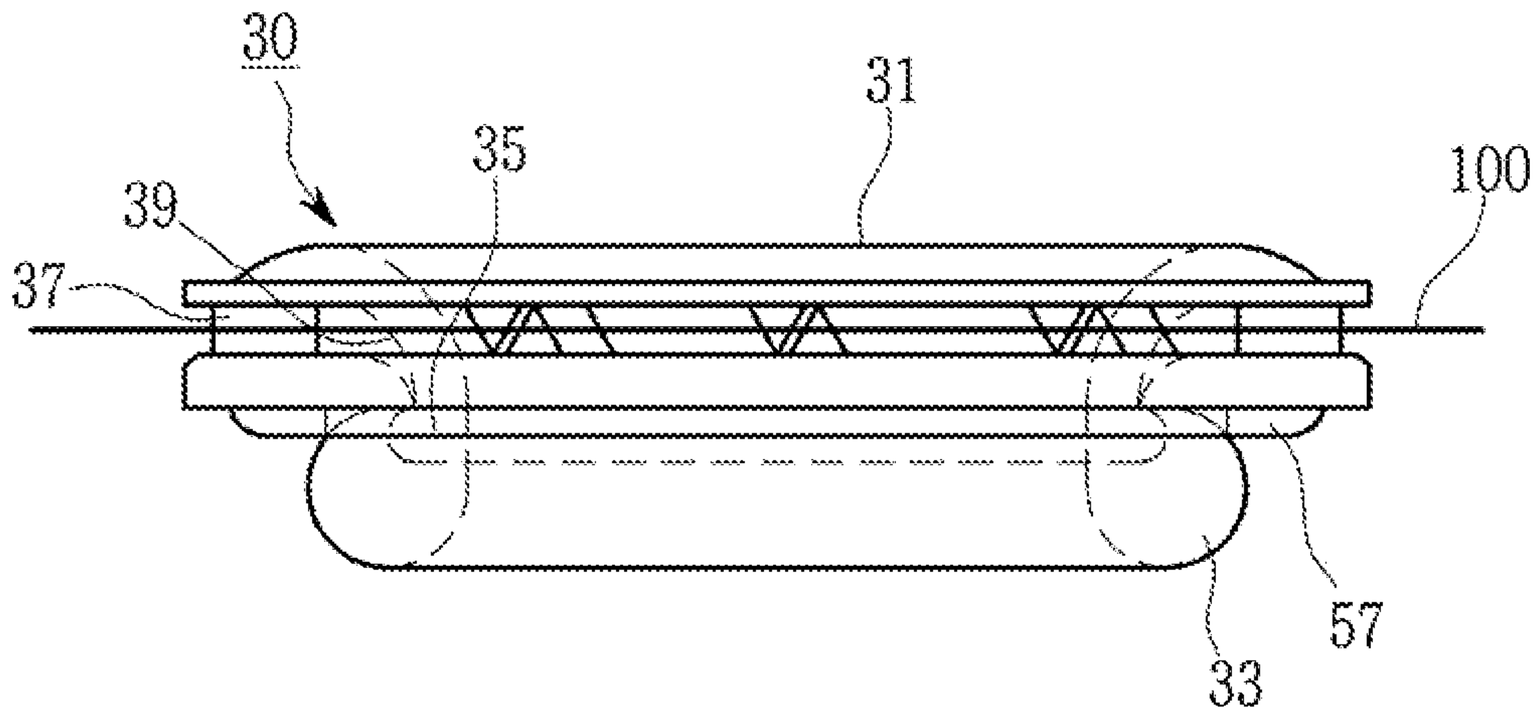


FIG. 10

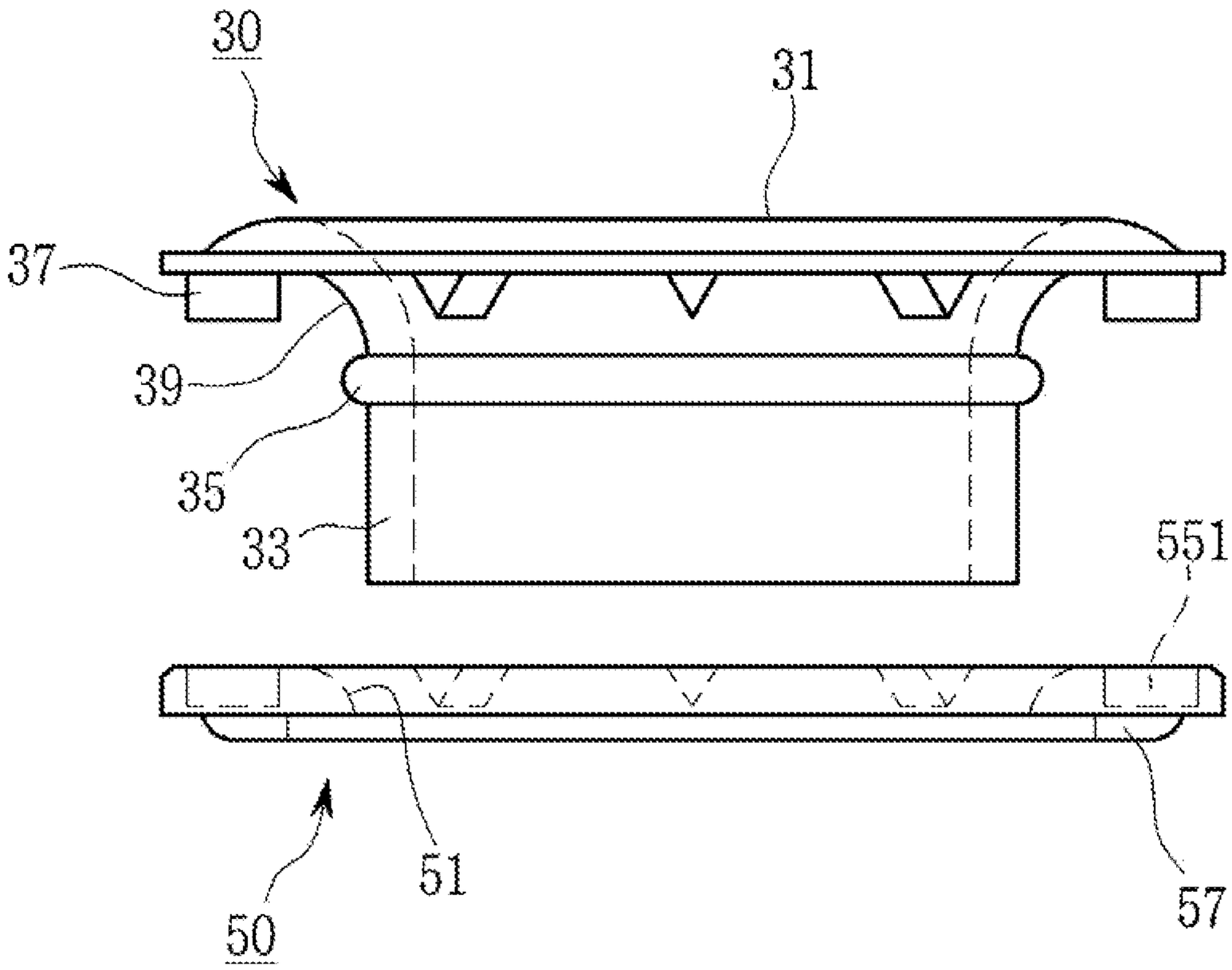
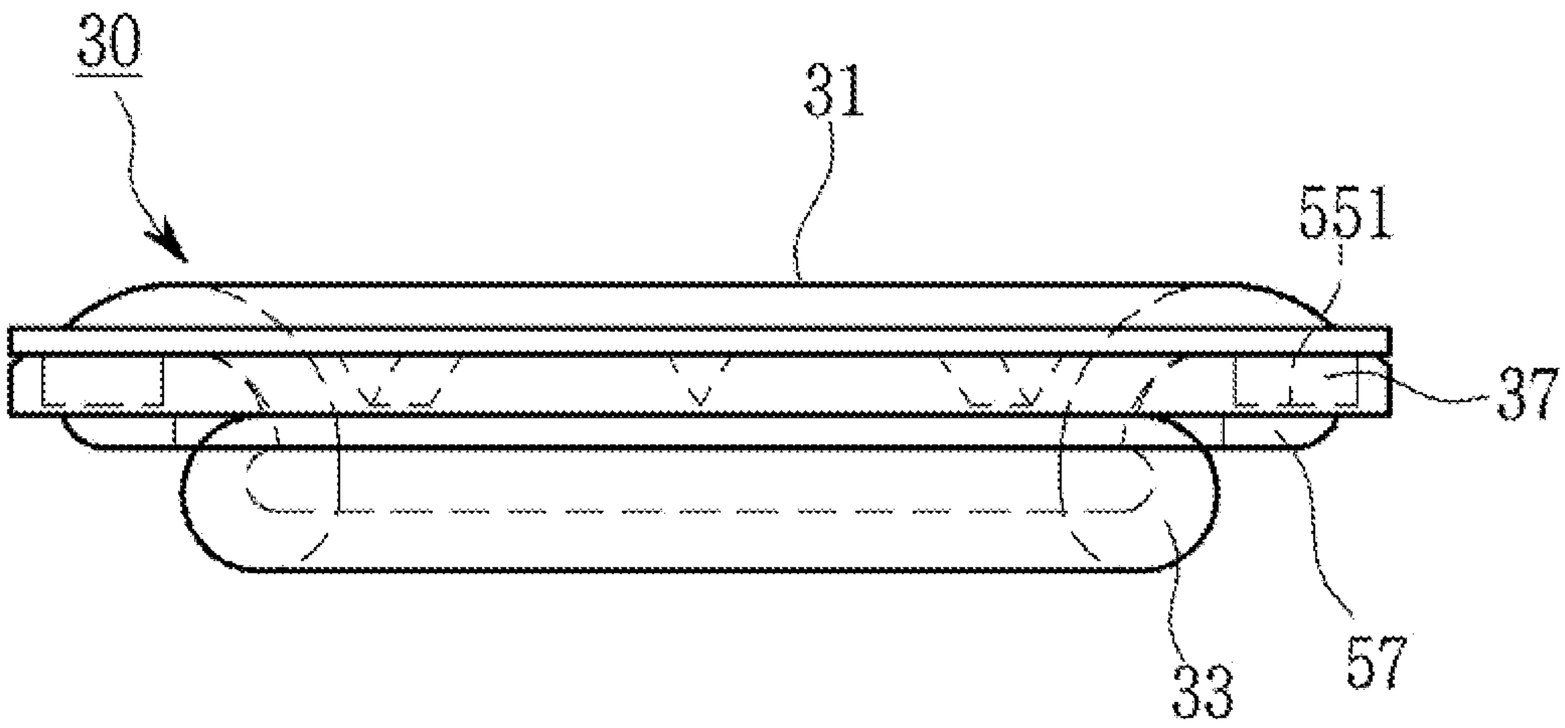


FIG. 11



EYELETS

CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority to and the benefit of Korean Patent Application No. 2018-0078073, filed on Jul. 5, 2018, the disclosure of which is incorporated herein by reference in its entirety.

BACKGROUND

1. Field of the Invention

The present disclosure relates to an eyelet, and more particularly, to an eyelet which is easily fastened and capable of providing a coupling force.

2. Discussion of Related Art

Generally, an eyelet is coupled to a document, vinyl, a fabric, or the like through a hole formed in the document, the vinyl, the fabric, or the like, and is used to connect or fix the above to another structure. Particularly, the eyelet is widely used with a fabric such as a tarpaulin. The tarpaulin is a waterproof fabric which is sturdy while being as light and flexible as vinyl, and the tarpaulin is made by crossing yarns formed of low density polyethylene (LDPE) and high density polyethylene (HDPE) as warp and weft yarns to form a fabric, and coating polyethylene (PE) which is the same material on upper and lower surfaces of the fabric.

The tarpaulin can be used for a variety of purposes, such as a shade cover, a tarp, a groundsheet, a cover of a truck, or the like. In this case, the tarpaulin is fixed by forming a hole in an edge portion of the tarpaulin and using a rope bound to the hole, and the edge portion of the tarpaulin can be easily damaged by the rope. In order to prevent damage, since an eyelet is coupled to the hole according to a circumference of the hole and comes into contact with the rope, the damage to the tarpaulin can be prevented.

However, a conventional eyelet is manufactured of a general plastic or metal, and since the eyelet formed of the general plastic or metal cannot be recycled with other materials constituting a tarpaulin, the eyelet should be separated from the tarpaulin to recycle the tarpaulin.

Further, in the conventional case, the eyelet is heated and pressed to be coupled to the tarpaulin, and in this case, the tarpaulin can be damaged by heat applied to the eyelet. Further, the eyelet is deformed by the heat and thus there is a problem that a coupling force between the tarpaulin and the eyelet is weakened.

SUMMARY OF THE INVENTION

The present disclosure is directed to providing an eyelet which can be coupled to a fabric without using heat.

Further, the present disclosure is directed to providing an eyelet capable of strengthening a coupling force between a fabric and the eyelet.

In addition, the present disclosure is directed to providing an eyelet recyclable with a tarpaulin.

Technical problems desired to be solved by the present disclosure are not limited to the above-described problems, and problems which are not mentioned may be clearly understood by those skilled in the art from the following disclosure.

According to an aspect of the present disclosure, there is provided an eyelet including an eyelet base and an eyelet washer, wherein the eyelet base includes: a disk-shaped base part having a circular hollow hole formed at a center portion thereof; a cylindrical fastening part formed to extend from an inner circumference of the base part formed by the hollow hole to be orthogonal to the base part, and inserted into a circular hollow hole in a center portion of the eyelet washer to be fastened to the eyelet washer; a fixing protrusion formed in a ring shape on an outer circumference of the fastening part to prevent separation of the eyelet washer from the fastening part; and a plurality of stoppers configured to protrude from a lower surface of the base part to prevent rotation of the eyelet washer fastened to the eyelet base, the eyelet washer includes: a plurality of protrusions formed on an upper surface of the eyelet washer facing the base part and whose movement is limited by the stoppers to prevent the rotation of the eyelet washer; and a protection protrusion formed in a ring shape to protrude from a lower surface of the eyelet washer, and the protection protrusion is configured to fix and protect a lower end of the fastening part inserted between the fixing protrusion and the protection protrusion due to plastic deformation when the eyelet base and the eyelet washer are fastened to each other.

A diameter of the fixing protrusion may be greater than a diameter of the circular hollow hole of the eyelet washer, and the fixing protrusion may protrude so as to have a step at the outer circumference of the fastening part. An upper portion of the fixing protrusion may include a flat surface vertical to the outer circumference of the fastening part, and a lower portion of the fixing protrusion may include an inclined surface connected to the flat surface.

Further, the eyelet base may further include a curved portion having a curvature at a portion in which the base part and the fastening part come into contact with each other.

The eyelet washer may be fastened to the eyelet base between the base part and the fixing protrusion, and an inner circumference of the eyelet washer may have an inclined surface so that an upper portion thereof may have a diameter greater than a diameter of a lower portion thereof.

According to another aspect of the present disclosure, there is provided an eyelet including an eyelet base and an eyelet washer, wherein the eyelet base includes: a disk-shaped base part having a circular hollow hole formed at a center portion thereof; a cylindrical fastening part formed to extend from an inner circumference of the base part formed by the hollow hole to be orthogonal to the base part, and inserted into a circular hollow hole in a center portion of the eyelet washer to be fastened to the eyelet washer; a fixing protrusion formed in a ring shape on an outer circumference of the fastening part to prevent separation of the eyelet washer from the fastening part; and a plurality of stoppers configured to protrude from a lower surface of the base part to prevent rotation of the eyelet washer fastened to the eyelet base,

the eyelet washer includes: a plurality of grooves formed in shapes corresponding to the stoppers in an upper portion of the eyelet washer facing the base part and configured to accommodate the stoppers in a one-to-one manner to prevent the rotation of the eyelet washer; and a protection protrusion formed in a ring shape to protrude from a lower surface of the eyelet washer, and

the protection protrusion is configured to fix and protect a lower end of the fastening part inserted between the fixing protrusion and the protection protrusion due to plastic deformation when the eyelet base and the eyelet washer are fastened to each other.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of the present disclosure will become more apparent to those of ordinary skill in the art by describing in detail exemplary embodiments thereof with reference to the accompanying drawings, in which:

FIG. **1** is a front view illustrating an eyelet according to a first embodiment of the present disclosure;

FIG. **2** is a perspective view illustrating an eyelet base **30** of FIG. **1**;

FIG. **3** is a plan view illustrating a lower surface of the eyelet base **30** of FIG. **1**;

FIG. **4** is a view illustrating another example of the eyelet base **30** according to the present disclosure;

FIG. **5** is a view illustrating still another example of the eyelet base **30** according to the present disclosure;

FIG. **6** is a plan view illustrating an upper surface of an eyelet washer **50** of FIG. **1**;

FIG. **7** is a perspective view illustrating a lower surface of the eyelet washer **50**;

FIGS. **8** and **9** are views for describing a method of fastening the eyelet base **30** and the eyelet washer **50**;

FIG. **10** is a front view illustrating an eyelet according to a second embodiment of the present disclosure; and

FIG. **11** is a view illustrating a state in which an eyelet base **30** and an eyelet washer **50** of FIG. **10** are coupled to each other.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

The above-described purposes, characteristics, and advantages will be more apparent through the following detailed descriptions with reference to the accompanying drawings, and accordingly, those skilled in the art may easily carry out the technical spirit of the present disclosure. Further, in a description of the present disclosure, when specific descriptions such as related technologies related to the present disclosure unnecessarily obscure the spirit of the present disclosure, a detailed description of the specific descriptions will be omitted.

Hereinafter, an eyelet according to an embodiment of the present disclosure will be described in detail with reference to the accompanying drawings.

First Embodiment

FIG. **1** is a front view illustrating an eyelet according to a first embodiment of the present disclosure, and FIG. **2** and FIG. **3** are views illustrating an eyelet base **30** of FIG. **1**. FIG. **4** is a view illustrating another example of the eyelet base **30** according to the present disclosure, and FIG. **5** is a view illustrating still another example of the eyelet base **30** according to the present disclosure.

As shown in FIG. **1**, the eyelet according to the first embodiment of the present disclosure includes an eyelet base **30** and an eyelet washer **50** coupled to each other with a fabric **100** such as a tarpaulin or the like therebetween. The eyelet base **30** and the eyelet washer **50** may be formed of a material recyclable with the tarpaulin, for example, a thermoplastic olefin-based resin, and the olefin-based resin may include one of polyethylene (PE) and polypropylene (PP). Here, when the eyelet includes the polyethylene (PE), it is preferable to use a mixture of low density polyethylene (LDPE) and high density polyethylene (HDPE). As described above, when the eyelet of the present disclosure includes a material recyclable with the tarpaulin, since the eyelet is recyclable with the tarpaulin without being separated from the tarpaulin, recycling is easy. Further, since the olefin-based resin has greater elasticity and is resistant against abrasion or deformation in comparison with general plastic or metal, the stability of the eyelet may be secured.

As shown in FIGS. **1** to **3**, the eyelet base **30** includes a base part **31**, a fastening part **33**, a fixing protrusion **35**, a plurality of stoppers **37**, and a curved portion **39**.

The base part **31** is configured in a disk shape having a circular hollow hole **311** formed at a center portion thereof.

The fastening part **33** is formed in a cylindrical shape, and an upper portion of the fastening part **33** is formed to extend from an inner circumference of the base part **31** formed by the hollow hole **311** to be orthogonal to the base part **31**. Further, the fastening part **33** is inserted into a circular hollow hole **53** in a center portion of the eyelet washer **50** to be fastened to the eyelet washer **50**.

The fixing protrusion **35** is formed in a ring shape on an outer circumference of the fastening part **33** to prevent separation/breakaway of the eyelet washer **50** from the fastening part **33**. A diameter of the fixing protrusion **35**, that is, a distance from a center of the hollow hole **311** to an outer circumference of the fixing protrusion **35** may be greater than a diameter of the circular hollow hole **53** of the eyelet washer **50**. Further, the fixing protrusion **35** may have a protruding shape to have a step at the outer circumference of the fastening part **33**. A cross-section of the fixing protrusion **35** shown in FIG. **1** has a semi-circle shape but may be configured in other shapes. For example, as shown in FIG. **4**, an upper portion of the fixing protrusion **35** may have a flat surface **351** vertical to the outer circumference of the fastening part **33** and a lower portion of the fixing protrusion **35** may have a curved surface **352** connected to the flat surface **351**. Further, as shown in FIG. **5**, the upper portion of the fixing protrusion **35** has the flat surface **351** vertical to the outer circumference of the fastening part **33**, and the lower portion of the fixing protrusion **35** may have an inclined surface **353** connected to the flat surface **351**.

The stoppers **37** are formed on a lower surface of the base part **31** to prevent rotation of the eyelet washer **50** fastened to the eyelet base **30**, and are formed in a shape protruding from the lower surface of the base part **31**. The stoppers **37** are radially arranged at predetermined intervals, a longitudinal direction of each of the stoppers **37** faces the center of the hollow hole **311**, and a cross-section of the stopper **37** has a triangular shape. The stopper **37** may be formed in other shapes.

The curved portion **39** is formed to have a curvature at a portion in which the base part **31** and the fastening part **33** come into contact with each other.

FIG. **6** is a view illustrating an upper surface of the eyelet washer **50** of FIG. **1**, and FIG. **7** is a perspective view illustrating a lower surface of the eyelet washer **50**.

As shown in FIG. **6**, the eyelet washer **50** includes a plurality of protrusions **55** formed on an upper surface thereof facing the base part **31**. The protrusions **55** are radially arranged at predetermined intervals on the upper surface of the eyelet washer **50**. When the eyelet base **30** and the eyelet washer **50** are fastened to each other, the protrusions **55** have their movement limited by the stoppers **37**. That is, the stoppers **37** and the protrusions **55** come into contact with each other to limit the rotation of the eyelet washer **50**. Further, since the stoppers **37** press the upper surface of the eyelet washer **50** and the protrusions **55** press the lower surface of the base part **31**, the rotation of the eyelet washer **50** is limited by this pressing force.

The eyelet washer **50** is fastened to the eyelet base **30** between the base part **31** and the fixing protrusion **35**, and an inner circumference **51** of the eyelet washer **50** has an inclined surface or a curved surface so that the eyelet washer **50** may easily move over the fixing protrusion **35** when the eyelet washer **50** is fastened to the eyelet base **30**. The inclined surface or the curved surface is formed so that an upper diameter of the inner circumference **51** is formed to be greater than a lower diameter of the inner circumference **51**.

As shown in FIG. **7**, the eyelet washer **50** includes a protection protrusion **57** formed in a ring shape to protrude from the lower surface thereof, and the protection protrusion **57** is used to fix and protect a lower end of the fastening part **33** which is plastically deformed.

Hereinafter, a method of fastening the eyelet base **30** and the eyelet washer **50** will be described. FIGS. **8** and **9** are views for describing the method of fastening the eyelet base **30** and the eyelet washer **50**.

As shown in FIG. **8**, when the eyelet base **30** and the eyelet washer **50** are pressed in a state in which the fastening part **33** is inserted into the hollow hole **53** of the eyelet washer **50** through a hole of the fabric **100**, a lower portion of the fastening part **33** is elastically deformed and thus the lower portion of the fastening part **33** is wrapped to the outside and rolled up in a circular shape. In this case, the lower portion of the fastening part **33** is elastically deformed by a physical force without using heat or ultrasonic waves, and the above is caused by a material characteristic of the eyelet according to the present disclosure.

When pressing continues, as shown in FIG. **9**, the eyelet washer **50** moves to a space between the base part **31** and the fixing protrusion **35** through the fixing protrusion **35**, and an end of the lower portion of the fastening part **33** reaches a space between the fixing protrusion **35** and the protection protrusion **57** after the lower portion of the fastening part **33** is rolled up in the circular shape. The protection protrusion **57** protects and fixes the wrapped lower portion of the fastening part **33**, particularly, the end of the lower portion of the fastening part **33** so as not to be released by external pressure or friction.

The fastened eyelet base **30** and eyelet washer **50** are fixed by the lower portion of the fastening part **33** which is plastically deformed and the fixing protrusion **35**, and as described above, a fastening state may be more stably maintained using a double fixing scheme.

Second Embodiment

FIG. **10** is a front view illustrating an eyelet according to a second embodiment of the present disclosure, and FIG. **11** is a view illustrating a state in which an eyelet base **30** and an eyelet washer **50** of FIG. **10** are coupled to each other.

Only a structure of the eyelet washer **50** in the eyelet according to the second embodiment of the present disclosure is different from that of the first embodiment, and other elements are the same as those of the first embodiment.

As shown in FIG. **10**, the eyelet washer **50** according to the second embodiment includes a plurality of grooves **551** instead of the protrusions **55** in an upper surface of the eyelet washer **50** facing a base part **31**, and the grooves **551** accommodate and fix the stoppers **37**. The groove **551** is configured in a shape which is easy to accommodate and fix the stopper **37**, and as shown in FIG. **10**, may be formed in a shape corresponding to the stopper **37**. Further, the grooves **551** are radially arranged at predetermined intervals in the upper surface of the eyelet washer **50** like the stopper **37**.

In addition, as shown in FIG. **11**, when the eyelet base **30** and the eyelet washer **50** are fastened to each other, since the stoppers **37** are accommodated in the grooves **551**, the lower surface of the base part **31** and the upper surface of the eyelet washer **50** come into close contact with each other. Accordingly, an interval/a space between the base part **31** and the eyelet washer **50** may be minimized, and the entire thickness of the fastened eyelet may also be reduced.

An eyelet according to the present disclosure is coupled to a fabric using pressure not heat and thus damage to the fabric due to heat can be prevented.

Further, since separation of an eyelet washer from an eyelet base using a fixing protrusion is prevented, a coupling force between the fabric and the eyelet can be increased.

In addition, when the fabric is a tarpaulin, since the eyelet includes a material similar to the tarpaulin, the fabric and the eyelet can be recycled together.

As described above, although the present disclosure is described according to exemplary embodiments for exemplifying the principle of the present disclosure, the present disclosure is not limited to configurations and actions which are shown above. Preferably, those skilled in the art may understand that many changes and modifications according to the present disclosure are possible without departing from the spirit and the scope of the accompanying claims.

What is claimed is:

1. An eyelet comprising:

an eyelet base and an eyelet washer,

wherein the eyelet base includes: a disk-shaped base part having a circular hollow hole formed at a center portion thereof; a cylindrical fastening part formed to extend from an inner circumference of the base part formed by the hollow hole to be orthogonal to the base part, and inserted into a circular hollow hole in a center portion of the eyelet washer to be fastened to the eyelet washer; a fixing protrusion formed in a ring shape on an outer circumference of the fastening part to prevent separation of the eyelet washer from the fastening part; and a plurality of stoppers configured to protrude from a lower surface of the base part to prevent rotation of the eyelet washer fastened to the eyelet base,

the eyelet washer includes: a plurality of protrusions formed on an upper surface of the eyelet washer facing the base part and whose movement is limited by the stoppers to prevent the rotation of the eyelet washer; and a protection protrusion formed in a ring shape to protrude from a lower surface of the eyelet washer, and

the protection protrusion is configured to fix and protect a lower end of the fastening part inserted between the fixing protrusion and the protection protrusion due to plastic deformation when the eyelet base and the eyelet washer are fastened to each other.

2. The eyelet of claim **1**, wherein a diameter of the fixing protrusion is greater than a diameter of the circular hollow hole of the eyelet washer.

3. The eyelet of claim **1**, wherein the fixing protrusion protrudes so as to have a step at the outer circumference of the fastening part.

4. The eyelet of claim **1**, wherein an upper portion of the fixing protrusion includes a flat surface vertical to the outer circumference of the fastening part.

5. The eyelet of claim **4**, wherein a lower portion of the fixing protrusion includes an inclined surface connected to the flat surface.

6. The eyelet of claim 1, wherein the eyelet base further includes a curved portion having a curvature at a portion in which the base part and the fastening part come into contact with each other.

7. The eyelet of claim 1, wherein the eyelet washer is fastened to the eyelet base between the base part and the fixing protrusion.

8. The eyelet of claim 1, wherein an inner circumference of the eyelet washer has an inclined surface so that an upper portion thereof has a diameter greater than a diameter of a lower portion thereof.

9. An eyelet comprising:

an eyelet base and an eyelet washer,

wherein the eyelet base includes: a disk-shaped base part having a circular hollow hole formed at a center portion thereof; a cylindrical fastening part formed to extend from an inner circumference of the base part formed by the hollow hole to be orthogonal to the base part, and inserted into a circular hollow hole in a center portion of the eyelet washer to be fastened to the eyelet washer; a fixing protrusion formed in a ring shape on an outer circumference of the fastening part to prevent separation of the eyelet washer from the fastening part; and a plurality of stoppers configured to protrude from a lower surface of the base part to prevent rotation of the eyelet washer fastened to the eyelet base,

the eyelet washer includes: a plurality of grooves formed in shapes corresponding to the stoppers in an upper portion of the eyelet washer facing the base part and configured to accommodate the stoppers in a one-to-one manner to prevent the rotation of the eyelet washer; and a protection protrusion formed in a ring shape to protrude from a lower surface of the eyelet washer, and

the protection protrusion is configured to fix and protect a lower end of the fastening part inserted between the fixing protrusion and the protection protrusion due to plastic deformation when the eyelet base and the eyelet washer are fastened to each other.

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